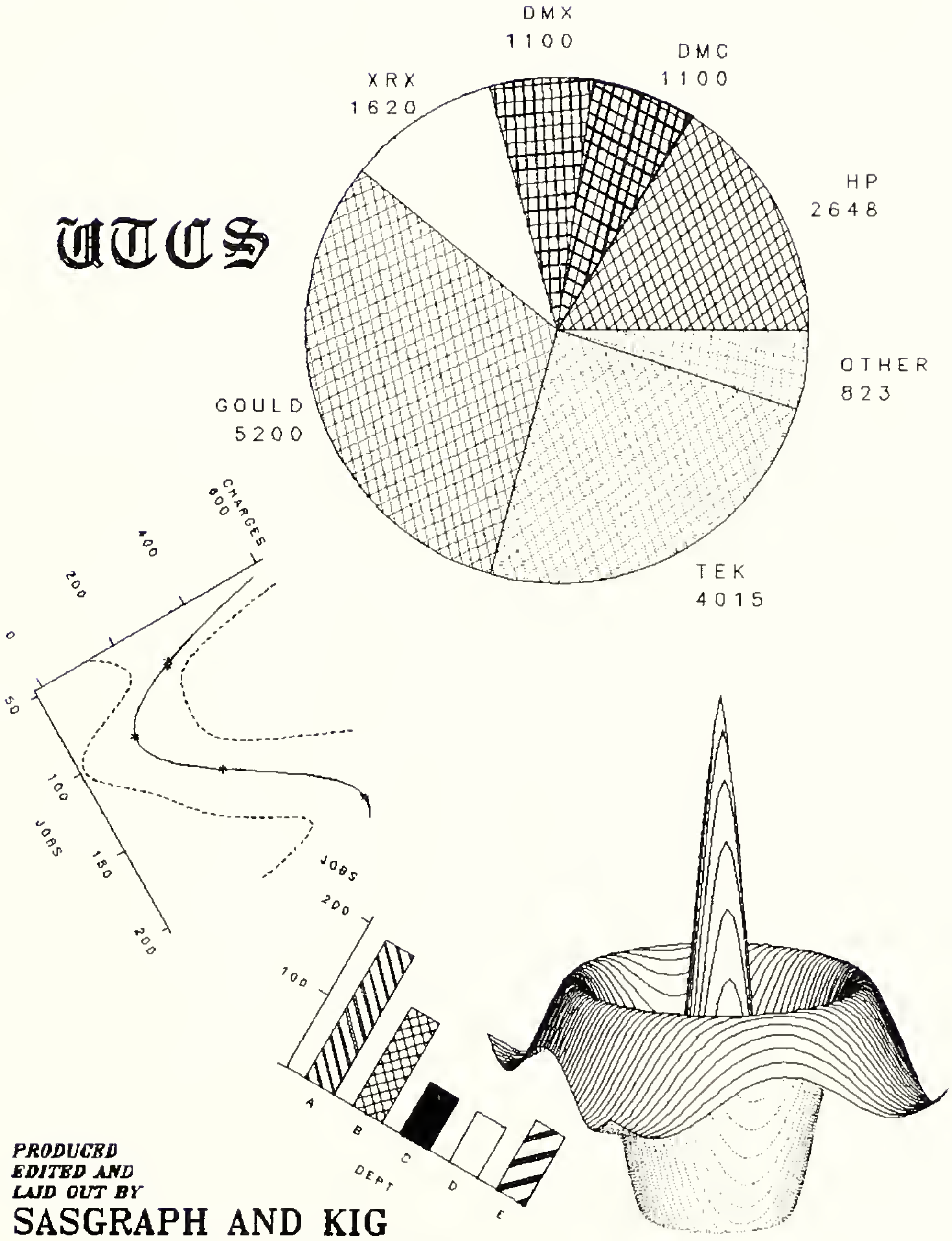
university of toronto
computing services

UTCS Computer News

April 81
No. 190
ISSN 0315-4661



PRODUCED
EDITED AND
LAID OUT BY
SASGRAPH AND KIG

Digitized by the Internet Archive
in 2018 with funding from
University of Toronto

https://archive.org/details/computernewsapri190paul

COMPUTERNEWS

Publisher

University of Toronto
Computing Services
Toronto, Ontario
Canada M5S 1A1

Editor

Paul Shindman

Subscriptions

Subscription changes should be entered on the tear-out form at the back of this issue and mailed to the Information Office, Engineering Annex, Room 206 (or phone 416-978-4990).

COMPUTERNEWS is a monthly publication produced by University of Toronto Computing Services. Enquiries or contributions should be directed to the Editor, Paul Shindman or Assistant Editor, Pat Smith in the Engineering Annex, Room 201 or (416)-978-2066. Layout and typesetting are provided by Kathryn Bourne using UTCS typesetting facilities.

Cover Story

This month's cover by Kin Fong illustrates five graphs generated on the GOULD plotter, using SAS/GRAPH. See the lead article on page 3.

Contents

Introducing SAS/GRAPH at UTCS 3
Upgrade of UTCS COBOL 5
Experimental 9700 Output Service 5
Thesis Preparation Service 6
VIVA - An Intelligent Workstation 6
The VIVA Experiment 10
DECsystem-10 News 12
UTCS Short Courses 14
Erratum: Of Turtles, Mice and Apples 15
User Exchange Column 15
A New Editor 15
Personnel Changes 16
New Titles in the DCS Library 16
Systems
Directory

Permission is granted to reprint articles from COMPUTERNEWS for noncommercial purposes provided the author, publication and issue are acknowledged.

INTRODUCING SAS/GRAPH AT UTCS

SAS/GRAPH is an extension of SAS (Statistical Analysis System) which provides intelligent graphics capabilities. SAS/GRAPH release 79.4 is currently available for testing on the Academic Services machine. A draft version of the user documentation for release 79.4 is available for reference at the UTCS Information Office or from a CSR.

As supplied by the vendor, SAS/GRAPH 79.4 supports a number of terminals and plotters. Unfortunately, many of these devices are not available at UTCS while other popular UTCS facilities such as the GOULD plotter are not supported. Therefore, an interface has been built between SAS/GRAPH 79.4 and a UTCS product called KIG - Kernal Interactive Graphics - which allows the terminals and plotters available at U of T to be used.

A SAS program resembles a PL/1 program. It is inherently a very comprehensive package: it is both a database manager and report generator which performs a wide variety of statistical and numerical analyses. The documentation for SAS is also complete and understandable.

The basic SAS package produces output for a line printer. Plots can be produced, but they are the type that can be done with regular characters on a line printer. SAS/GRAPH 79.4 offers the following features:

- Extensions to the TITLE statement (which produces multi-line titles for a page of output) allowing the colour, size and font type of the text to be specified (each line of title, and in fact, each word in a title line, can have a different colour, size and font).
- A FOOTNOTE statement, which is for producing multi-line footnotes for a page of output. Colour, size and font can be given as in the TITLE statement.
- A GOPTIONS statement, comparable to the SAS OPTIONS statement, is for specifying Graphics Options, such as the type of the Graphics device, the baud rate, the names of the colours the device has (or line weights), and how smart the device is (hardware circles, polygons, characters, etc.).
- A new procedure called GPLOT, which is the SAS/GRAPH version of the SAS PLOT procedure. Most of the statements and options are the same as those in the PLOT procedure. The CONTOUR option is not supported in GPLOT, but will be implemented as the GCONTOUR procedure in the next release of SAS/GRAPH (79.5).

For experimental observations involving two variables, GPLOT plots one variable against another. GPLOT automatically scales the values on the axes of the plot or allows you to specify your own scale. Logarithmic plots may be produced this way.

Optionally, you can:

- draw horizontal and vertical lines on the plot
- superimpose two or more plots
- use any symbol to represent the points on the plot
- select colours, symbols, interpolation methods and line styles for the plot
- produce vertical and horizontal bar charts (histograms), pie charts, star charts and block charts. These charts are useful for illustrating graphically a given variable's values or the relationships between two or more variables.

GSLIDE produces coloured slides containing lines of text. Its multiple font capabilities include:

Times Roman
Boldface Times Roman
Script
Italics
Old English

continued...

SAS/GRAPH continued

Old German.

There are also special fonts for maps and musical, atmospheric and scientific plots.

Three dimensional plots can be obtained by plotting the values of 3 variables. Scaling is done automatically. Various parameters are available to rotate the graph and to change colours, line weights and backgrounds.

The size of a plot can be scaled to a certain extent if it is to be output to the GOULD plotter or to any of the devices added through the interface with KIG. However, if the plot goes to one of SAS/GRAPH's supported terminals you have limited scaling capability.

SAS/GRAPH can be used interactively through TSO, or in batch (possibly submitted from WYLBUR or the DEC-10). Used interactively, SAS/GRAPH can use any of the terminals or plotters supported. Used from batch, SAS/GRAPH can only use the GOULD for output.

The devices supported are:

SAS/GRAPH by itself supports CAL1012 (Calcomp 1012), HP7221, HP2647, HP9872 (Hewlett-Packard 7221, 2647,9872), TEK4662, TEK4663, TEK4010, TEK4025, TEK4027 (Tektronix 4662, 4663, 4010, 4025, 4027), ADI150, RAM6200 (Ramtek 6200), SER281 (Servagor 281), IBM3278, IBM3279 (with special feature installed).

In addition, the next release of SAS/GRAPH (79.5) which is due shortly will support:

HP2648, HP7220, Zeta 1453, Chromatics 1398, 1399, 1598, 1599, 1998,1999.

SAS/GRAPH, using the KIG interface, supports:

DECVT52, DMC1100, DMX1100A (Datamex 1100A), HP2648 (Hewlett-Packard 2648), TEK4015 (Tektronix 4015), VC303A (Volker-Craig 303A), XRX1620 (Xerox-diablo 1620, 1640) and GOULD (GOULD 5200).

The Future Release of SAS/GRAPH (79.5)

- MAPS. The *next* release of SAS/GRAPH offers three procedures for mapping: GMAP, GPROJECT, GREDUCE.

  GMAP produces choropleth and surface maps. Choropleth maps display responses within certain unit areas like states or countries. The user selects the patterns and colours with special statements. Surface maps, drawn in your colours selected by the users, give oblique perspective views of surfaces. The user can create his own map dataset containing geographical coordinates or use one of those provided with the new SAS/GRAPH.

  GPROJECT applies one of several projection techniques to a map dataset and creates a new map dataset.

  GREDUCE processes a map dataset so that subsets of the data that retain the overall appearance of the map can be created.

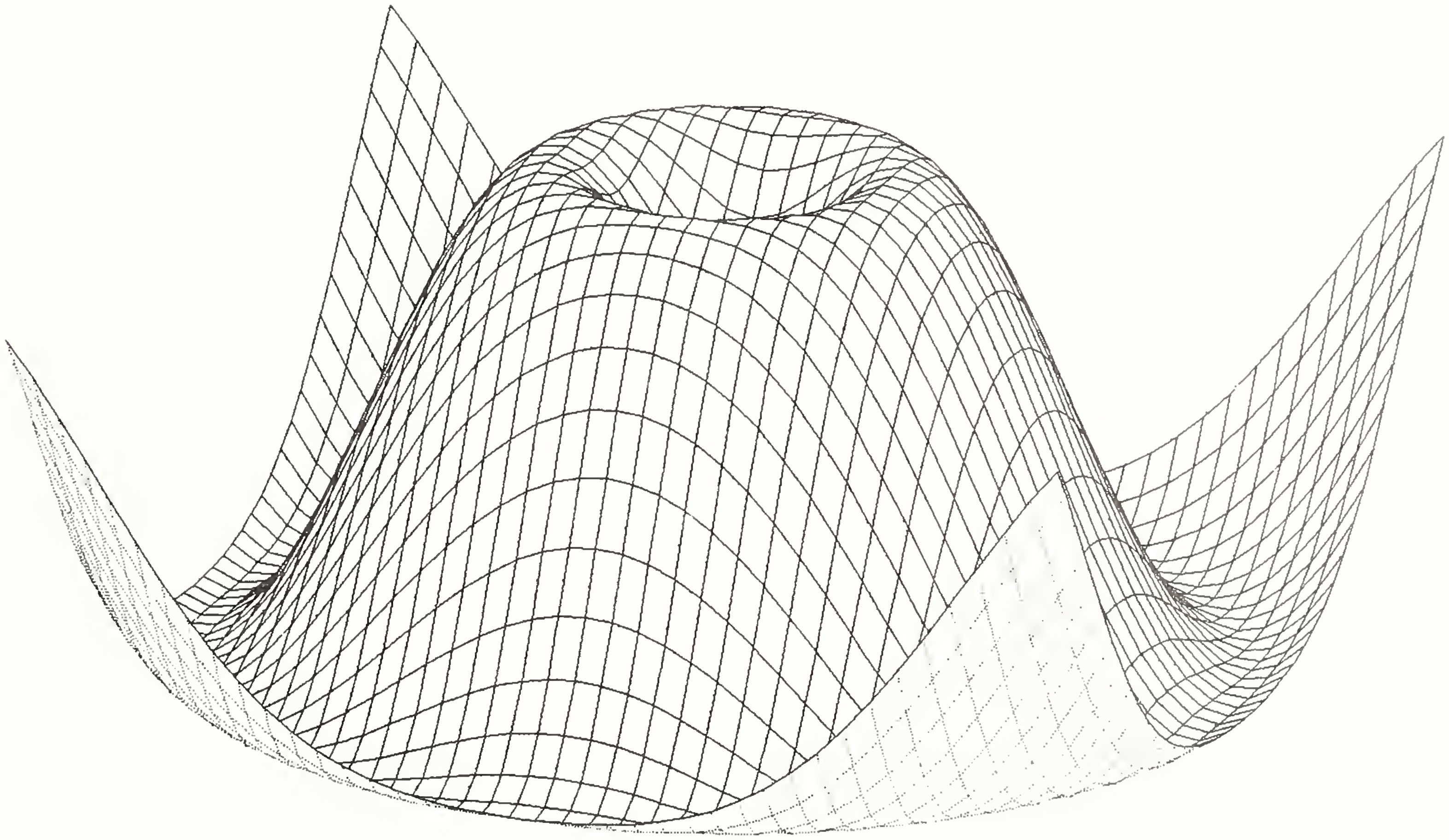
- Superscripts and subscripts in titles and footnotes (and NOTE statements) are supported, as well as slanting the text, and putting boxes around the text.

- The output from any SAS procedure can be redirected and redisplayed at a graphics device with colours, titles, footnotes (with different fonts, colours and size for the titles and footnotes).

- The output from a number of SAS and SAS/GRAPH procedures can be individually scaled and then stored (or appended) in a SAS dataset. Using the SAS/GRAPH procedure GREPLAY, individually stored plots or all the stored plots can be redisplayed.

continued...

THE COWBOY HAT



```
GOPTIONS DEVICE=HP2648 NOCHARACTERS
         COLORS=(NORMAL TRIPLE DOUBLE SINGLE DOTTED1 DOTTED2)
         VSIZE=10.5 HSIZE=18.1 VPOS=24 HPOS=62;
DATA;
  DO X = -5 TO 5 BY .25 ;
  DO Y = -5 TO 5 BY .25 ;
   Z=SIN(SQRT(X*X+Y*Y));
   OUTPUT;
  END;
  END;
PROC G3D;
  PLOT Y*X=Z/CTOP=NORMAL CBOTTOM=DOTTED2
        CAXIS=NORMAL CTEXT=NORMAL NOAXES;
```

SAS/GRAPH continued

- CONTOUR PLOTS. The *next* release of SAS/GRAPH has the GCONTOUR procedure which produces contour plots, where values of 3 variables are represented in 2 dimensions. You can choose colours and styles for up to 100 levels of contour.

Hints:

- Those who find TSO too expensive, but have a nice graphics terminal with which to view things may run a batch job (possibly submitted from WYLBUR) and put the GOULD plotting output into a dataset. KIG may be used under TS0 to view the output at the (Graphics) terminal.

Watch HOTNEWS and TSO logon messages for further information.

This installation marks the *initial* version of the package at UTCS. We value user comments and would like to know if you experience any technical difficulties. Please contact your CSR if you have any questions or problems.

Rob Janes

Editor's Note: See the insert - The Cowboy Hat - generated through TSO, by the included SAS/GRAPH program.

UPGRADE OF UTCS COBOL

UTCS will soon upgrade its COBOL service to the IBM/OS/VS COBOL Compiler and Library Program Product.

The new COBOL has many useful features some of which are a MERGE facility, subprogram linkage capability, extended debugging facilities and several new source language options.

A complete description of the package may be found by reading the IBM Program Product Publication, *IBM OS/VS COBOL COMPILER* and *LIBRARY, GENERAL Information,* Form GC 28-6470 (and related documents).

Please watch HOTNEWS for implementation details.

Herb Kugel

EXPERIMENTAL 9700 OUTPUT SERVICE

The growth of word processing at UTCS has created a need for a high quality, high-speed output service. Nowadays users need:

- high quality output
- multiple copies
- one or two sided printing
- a selection of character sets.

During the past few months UTCS carried out preliminary tests using a new type of printer belonging to U of T Library Automation Systems (UTLAS) called "Xerox 9700 Electronic Printing System." The machine combines xerographic, laser and computer technologies to produce high quality output on single or double-sided 8 1/2 by 11 paper. In addition, the machine can produce multiple, collated copies of the same document.

Users will be able to make use of this printer through an experimental service starting on May 1st. The purpose of the six month experiment is to help UTCS determine what features would be most useful in a full production system.

continued...

9700 OUTPUT continued

Initially, users will be able to use the 9700 to produce output in 10 or 12 pitch sizes, in both vertical *portrait* and horizontal *landspace* orientation. In addition, a special, small font is provided to allow normal computer output - 132 characters to a line - to be printed on 8 1/2 by 11 paper. Some of the styles are shown on the enclosed insert.

During the experimental period users will be charged a forms mount of $3.25 per job and will be charged 7 cents for each page of output produced (14 cents for both sides of duplexed output), billing to be applied against the user's Customer Account Number or CAN. Turnaround is expected to be 48 hours. Output will be picked up from the I/O room in McLennan Labs.

Users who are interested in this service should contact their CSR, with the Text Entry Group -Vera Cabanus, 978-5040 - or with the Text Services Group - John Bradley, 978-3995. Users are reminded that any aspect of the experimental service, including charging rates, may be changed when and if a full production service is put into place -- depending upon the experience gained with the experimental system.

John Bradley

THESIS PREPARATION SERVICE

A thesis preparation service is available at UTCS. Interested graduate students should obtain a SAC from their departments or supervisors.

Using this account, the student may either enter and edit text on a terminal attached to any UTCS computer or ask the Text Entry Group at UTCS to perform any part of this function at normal rates. When using a student account, the rate is $12. per operator hour. If no account is provided, the rate is $15. per operator hour.

Final thesis copy is normally Xerox 9700 output. Typical rates for a 100-page, single-space thesis are $17.50 for the first copy and $10. per additional copy. Each copy will be collated. Typesetting is not supported under this facility.

Frank Spitzer

VIVA - AN INTELLIGENT WORKSTATION

Editor's Note: This article and the next one, *The VIVA Experiment*, complete our discussion of the VIVA project at UTCS. In previous months, we examined some of the trends in the computing and communications industries and how these trends could be best applied when planning alternative computing services for UTCS.

VIVA is a *concept* based on a distributed computing workstation. The hardware model for the design includes a computing processor unit, a storage device (of five million characters or more), a fast CRT display device, a communications facility and optional interfaces to other equipment.

This hardware model is fitted with suitable software that provides the functional capabilities to be outlined in this article. A great portion of this software is developed and maintained at the centralized facility and is distributed to the workstation using the communications network. These workstation facilities are dedicated to the user and are employed extensively to improve his ability to use all computing capabilities of the system.

continued...

Xerox 9700 Output

```
Samples of characters:


Aa Bb Cc Dd Ee Ff Gg Hh Ii Jj Kk Ll Mm Nn Oo Pp Qq Rr Ss Tt Uu Xx Vv Ww Zz
1  2  3  4  5  6  7  8  9  0  `  {  @  #  $  %  ¬  &  *  (  )     -  +  =
˘  ¯  ¨  ˇ  `  ˙  ^  ˇ  ˘  ˚  ˟  ˜  ´
                                       ⊞  ➡  ©  ■  †
¢  ¿  ¡  ˟  Σ  π  µ  Δ  γ  `  .  <  (  +
&  α        ư  ơ     ð  £  !  $  *  )  ;
-  /  1  "  ɫ  ,  %     >  ?  ’  Ơ     `  :  #  @  '  =  "  (  +  )  |  -  1  }
~
   [
0  1  2  3  4  5  6  7  8  9  .           ]     ®     )     -     9  8  7  6



Samples of characters:

Aa Bb Cc Dd Ee Ff Gg Hh Ii Jj Kk Ll Mm Nn Oo Pp Qq Rr Ss Tt Uu Xx Vv

Wv Zz 1 2 3 4 5 6 7 8 9 0    @ # $ % ¬ & * ( )   - + = !   ↑ \ : ; "'

} { , . ? /    . < ( + | & ! $ * ) ; ¬ - / , %   > ?

: # @ ' = " ° ≤  ( + ┼ └    )
  [ ≥

0 1 2 3 4 5 6 7 8 9      ] ≠ –



Samples of characters:

Aa Bb Cc Dd Ee Ff Gg Hh Ii Jj Kk Ll Mm Nn Oo Pp Qq Rr Ss Tt Uu Xx Vv Ww Zz

1 2 3 4 5 6 7 8 9 0 ¢ ° @ # $ % ¬ & * ( ) _ - + = ! ¢ ↑ \ : ; "'

} { , . ? /  ¢ . < ( + | & ! $ * ) ; ¬ - / , % _ > ?

: # @ ' = " { ≤ ( + ┼ } ¤ ) ± ■ ° └
┌ [ ≥ ●

0 1 2 3 4 5 6 7 8 9 ┘ ┐ ] ≠ –
```

INTELLIGENT WORKSTATION continued

The notion of 'workstation' is used to denote the single-user orientation of VIVA. The actual hardware employed could be a multi-user, time-sharing system serving a community of users with similar interests, as described last month. In this mode, the software insulates the individual user from the complexities of shared resources, i.e., the system still appears to him to be dedicated to his personal use. The 'VIVA system' then could be a single-user, microcomputer station, or a small number (2-10) of stations sharing a mini-computer, or several stations using a medium to large scale time-sharing computer.

UTCS and it's user community recognize that it is often difficult to use the interface between user and most vendor-supplied computing services. The historical reasons for this situation are many: the high costs of computing hardware, the complexity of the systems involved and the character of the designers, to name a few. VIVA is specifically designed to overcome these deficiencies.

The design of VIVA includes a high speed, interactive dialogue. This forms a conversational interface with the human being who operates the workstation. It includes instant feedback, a comprehensive manual and menus or forms using an easy fill-in-the-blanks approach. This menu concept has been used very successfully for other applications here at U of T and elsewhere. These interactive menus or forms are windows to a simple, single-user computing environment. By applying the principles of human engineering, the services available locally at the workstation (remotely at other computing facilities on campus) and communication with colleagues are both presented as uncomplicated services easily manipulated by the user. A major function of the workstation is to provide a simple user interface to hide the complexities and technical details in using large, modern computing facilities.

In addition to acting as a human interface, VIVA also has computing capabilities. Through standard programming languages, the user can accomplish computing tasks effectively. Since the workstation can be directly tailored to the user's environment, the usefulness of this feature is much greater than similar services provided by large centralized computers. The computational capabilities of the workstation are adequate to perform instructional computing, basic graphics, computer-assisted instruction and sophisticated text processing involving multiple fonts, proportional spacing and basic document formatting services. These attributes of VIVA assist the user by presenting data to him in a way which makes sense to him and by expediting the development of solutions to his problems.

It is also interesting to note that the software tools used to construct this VIVA environment are included with the VIVA workstation. Using these tools, users may easily reshape the workstation to meet their own requirements. Using the network capability and centralized facilities, the user can share these enhancements with colleagues.

Distributed Computing Workstation for Student Services

The student computing facilities offered by U of T have remained essentially unchanged since 1970. The current facility is punch card oriented. The student prepares and edits his job using a keypunch, queues to submit his job through a card reader to the 3033 computer system for processing, waits to receive his output listing on a line printer, consults a student advisor to resolve problems and repeats the cycle until his job runs correctly. One and one quarter million student jobs are run in this fashion every year accounting for 60% of our card stock, 45% of our paper stock and 25% of the 3033 processor usage. Moreover, the current system is very costly in terms of student time to the detriment of the amount of time he has available for other courses of instruction and also the amount and sophistication of computing instruction he can receive.

continued...

INTELLIGENT WORKSTATION continued

The requirements of instructional services fit the capabilities offered by workstations extremely well. Using sophisticated tools like interactive dialogues and screen editors, online tutorials and documentation and proximity to user work areas, the student user can improve his productivity with a smaller investment of time. The workstation provides an educational environment, conducive to concentration. Additionally, interactive student services can be provided at reduced costs in comparison to our current services.

Although a considerable portion of instructional computing (perhaps 70% - 80%) could be done completely in the workstation environment the central site facilities will be needed for two important functions:

1. to distribute data and programs from course instructors for student assignments;
2. to provide central computing services in the cases where the facilities of the workstations are too modest in either storage or processing capability, or in software availability.

Note that in the latter case the program preparation facilities of the workstation are an effective student aid which would continue to be used.

Distributed Computing Workstation for Research Services

For the research community, there are four identifiable areas that could make productive use of the distributed computing workstation:

1. These units would be interfaced to laboratory equipment for the purposes of experimental data collection, analysis, presentation and experimental control using interactive, dialogue-based systems.
2. Text data capture is one of the major problems in the application of computing to the humanities research area. The entering of text using existing, large, computer-based services is a complex and expensive task. The distributed computing workstation would serve these needs and reduce the complexity and costs of text data capture.
3. The results of all research activity are documented in some form: theses, papers submitted to journals, presentations at conferences, etc. The workstation with well-designed, word processing software would greatly facilitate the entry, editing and formatting of documents relating to research activity and would enhance the appearance and quality of documents reporting research activity.
4. The researcher would still require the central computing facilities for the analysis and storage of large amounts of data, or for the use of centralized, high quality, hardcopy devices (high resolution plotting, photo-typesetting, etc.)

Distributed Computing Workstation for Administrative Users

There are two main areas where the distributed workstations would help the administrative user:

- Text Processing Services
- Office Automation Services

The traditional database applications would remain centralized since this application is best addressed with centralized facilities (sharing, security, backups, large volume of data, etc.)

Since the areas of text processing and office automation are very important to both the research and administrative user communities, they are now described in more detail.

Text Processing Services

The text processing services that UTCS offers today are principally an outgrowth of text editing and formatting systems

continued...

INTELLIGENT WORKSTATION continued

developed for use by data processing personnel (subsequently enhanced for secretarial use). These systems are neither easy to use nor designed as interactive systems using screens (as are the microcomputer-based word-processing systems). On the other hand, current word processing systems do not offer the high quality typesetting, high speed, multiple copies, high volume, output capabilities and large data storage facilities that are available on large computers.

UTCS' objective is to provide a fully integrated text processing service that would make most effective use of the combined capabilities of large and small computing facilities.

The implementation of an integrated text processing system would proceed in three distinct phases:

1. Develop human-engineered, word processing software for the VIVA workstations.
2. Install and implement software support for a high quality, high speed, laser printer at the large computer facility. A laser printer would serve two functions: (1) to provide existing computer printout services, eliminating most of the requirements for preprinted special forms and most of the centralized printer units and (2) to provide high quality, high volume and multiple copy output services required for text processing. Laser printers offer flexibility, versatility and speed unavailable with the impact printers.
3. Finally, install and implement software support for phototypesetting for textbook quality output.

Office Automation

It is projected that office systems and data processing services are going to be merged in the future. Electronic office systems will be an outgrowth of the standalone word processing systems available on the market today.

The workstations, other terminals and supporting computer systems could all be connected to a communications network. In this environment, correspondence and reports would be composed and proofed using word processing workstations, distributed via the communicatons network to other workstations and filed in electronic form in a computer database this facilitating subsequent search for and retrieval of documents. Centralized services would include high quality output for publishing documents and for high volume production of multiple copies of reports and documents.

The electronic office system could also provide personal services such as scheduling meetings with other members on the network, providing follow-up files for future action, maintaining lists (mailing lists and telephone directories) and office datafiles such as personnel files, budget files, etc. The integration of word processing and data processing technologies serviced by a common communications network would form the basis of the electronic office of the future.

Terry J. Wood
Ian F. Darwin

THE VIVA EXPERIMENT

In addressing the application of the workstation concept to University of Toronto Student Instructional Services (SIS), UTCS formulated three distinctive phases of implementation.

1. Provide a human-engineered, interactive, dialogue-based system for student job preparation, editing, submission to the central computer for processing and output viewing. This workstation will provide online tutorials and documentation so that the workstation teaches the user how to use the system and provides immediate advice when he encounters a problem. As well, the enhanced editing functions of the workstation have great pedagogical benefits in facilitating proper program layout and documentation, essential to structured programming techniques now being taught. Phase I when fully implemented, will replace all keypunches, card readers, card stock and two thirds of the paper stock and line printer capabilities currently used by the student service.

2. Phase II will provide the additional capability of execution of the most highly-used language processors within the workstation environment rather than transmitting it to the central site for execution. It is estimated that 70% of all student jobs could be executed on the workstation by the end of Phase II, off-loading 18% of the IBM 3033's workload.

3. Phase III could provide specialized student services that are not available in any effective form today, e.g., local graphics capabilities, computer-aided instruction, etc.

UTCS has implemented an experimental workstation to the specifications of Phase I VIVA. Eight of these units and a low speed printer were acquired and installed. Two undergraduate courses agreed to participate in the experiment using VIVA instead of unit record facilities for their course assignments. Access to the VIVA room was restricted by issuing authorized users with room keys. In addition to keys, students were given a pair of diskettes and several booking stickers. The booking scheme allowed users to reserve up to five one-hour slots per week for use of a workstation during normal hours of service (from 8 am to 10 pm). After these hours the stations were available on a first-come-first-served basis.

At the end of the first term, participating professors, teaching assistants and students were asked for their opinions of the VIVA workstation environment. This was done by administering questionnaires to the students and by interviewing the professors and teaching assistants. The principal results of the experiment showed that students strongly supported the cardless environment - particularly the interactive dialogues and also the human and humane environment that VIVA achieved. Users were dissatisified with slow response time on job submission and diskette operations. Thus we may conclude that the experimental Phase I of VIVA was a success, with some minor technical difficulties yet to be resolved.

The Transportability Issue

The current VIVA workstation is based on a DEC LSI/11. This base was chosen for an initial implementation because of the large software base available and our own existing expertise with the product. The initial single-user version used the vendor's RT-11 operating system. The multi-user system is based on UNIX using a commercially available emulator for DEC's RT-11. This approach was chosen to minimize the conversion effort.

continued...

THE VIVA EXPERIMENT continued

Although this was satisfactory for the experimental stages of VIVA, it leaves our ability to adapt to less expensive and more capable technology in the hands of a single vendor. This is a highly undesirable situation and can be circumvented by the application of a special software technique: portability. This technique, which has recently been popularized by the successful work of the University of California at San Diego, allows the evolving software base for VIVA to be usable *on many different brands of computers.* This situation brings several peripheral advantages. It makes possible the implementation of a *single base of software* which can be distributed to various types of computers from the central site, as previously described. It provides a consistent user interface to many different types of hardware which permits users to move from one computer to another without having to learn a new editor or command language. It allows the choice of hardware for VIVA to be as flexible as it's software, a fit determined by the user's application, his needs, operating requirements and financial constraints. Additionally it allows users who have access to the central facilities to develop applications for VIVA workstations.

Conclusion

This set of articles has dealt with several issues relating to the future of computing services at University of Toronto. Many goals to improve the scope and usability of these services have been outlined. The strategy being employed to achieve these goals is:

- to acquire hardware as outlined and provide these workstations for student services and for parties interested in application development;

- to construct and field test the required software using advanced transportable programming techniques to protect the software investment. Having done this, to provide this software as a centralized library of applications programs on the large computer system so as to facilitate software maintenance, to permit sharing of applications programs and to reduce the software development and user support costs for distributed systems;

- to establish a communications network to support the distributed workstations and small shared systems in the future. The broad band local area network must tie together the major systems at UTCS as well as specialized computing facilities established within different departments of the University. Access to national and international educational networks and common carrier networks will enhance academic inter-communications and permit access to unique services and resources not otherwise available.

It is the goal of the VIVA project that these activities come into clear focus during 1982, and that the University is able to enjoy the benefits outlined in this report through the remainder of the decade.

Terry J. Wood
Ian F. Darwin

DECSYSTEM-10 NEWS

TOPS-10 Version 7.01 is here!

TOPS-10 version 7.01, the long-awaited new version of the DECsystem-10 operating system, was officially made available to UTCS users on Wednesday, February 25, 1981. This latest edition of TOPS-10 contains many attractive new features which are described below in some detail. The differences between 7.01 and 6.03A that are most apparent to the user are the improvements in video terminal support, the ability of users to define their own ersatz devices and several improvements in RUN type commands.

There is also support in 7.01 for new products to be released in the near future. In addition, 7.01 is expected to be much more crash resistant. When it does crash it should take much less time to restore the system.

One announcement from Digital that may affect a few of our users is that 7.02, the version of TOPS-10 expected to be released in mid-1982, will no longer support 2741-like terminals. (Although the 6.03 and 7.01 monitors do support EBCDIC and Correspondence Code terminals, they are inconvenient to use and UTCS has always discouraged their use.)

The following is a summary of the most interesting features of 7.01:

- **New Terminal Start-up Procedures.** The first character typed by a user after connecting to the system will cause the message "CONNECTING TO HOST SYSTEM." to be typed. The monitor dynamically assigns the lowest available TTY number and runs the INITIA program to set up the TTY. If a TTY does not control a logged-in job and is idle for 100 seconds, "HOST SENT DISCONNECT." is typed on the terminal and the TTY is deassigned and logically disconnected. In addition, data set lines are physically disconnected.

- **System Crashes and Terminal Messages.** When the DECsystem-10 crashes "PATH TO HOST SYSTEM WAS LOST." is typed on the user's terminal. If the system is already down, typing on the terminal will cause "NO HOST IS AVAILABLE." to be typed, in response. Continuing to type while the system is down could cause "LOCAL INPUT BUFFER FULL. CHARACTER NOT STORED." to be typed. When the system is restarted "HOST IS AVAILABLE." will be typed on the terminal and normal communications resumed.

- **Page Size Command.** The monitor command "TTY PAGE n" will cause TTY output to be automatically stopped and the terminal's bell to be sounded after n lines of output have been typed. The user may continue the output with XON (control-Q). If n equals 0 or is missing, the output will never stop automatically. Note that the line counter is reset each time the monitor is through sending output to the terminal. This could occur because the user typed XOFF (control-S) manually, because an intelligent terminal made use of XOFF/XON automatically or because the monitor's output buffer was exhausted.

- **Terminal Characteristics Command.** The monitor commands "TERMINAL x" and "TTY TYPE x" allow the user to specify the terminal type (using the mnemonic "x") being used. This causes a number of terminal characteristics to be set automatically. If the terminal is a display terminal, it enables the special screen control features described below. These characteristics may also be set up in the LOGIN line of a SWITCH.INI file (see the /TERMINAL description of the LOGIN help file). The set of TTY characteristics set up can be determined

continued...

DECSYSTEM-10 NEWS continued

with the "INITIA/TTY" command. The list of terminal types presently supported appears near the end of the "HELP#*" command output. Users with terminal types which they would like to have included are invited to contact the DEC-10 Systems Group.

- **Canonical Terminal Screen Control.** If the user's terminal is a known type of display terminal, certain character handling features will be implemented. These include the following:

Char	Function
del	erase previous character
^W	erase previous word
^U	erase input line (following prompt)
^R	retype entire line (including prompt)

- **TTY DEFER Command.** The monitor command "TTY DEFER" causes echoing to a video terminal to be suppressed until all output to the terminal is finished. It may be necessary to use this command to make the video screen control (described above) work properly.
- **MERGE command.** The new monitor "MERGE file" causes the low segment of the program in the specified EXE file to be combined with the program currently in memory. An error occurs if the logical address spaces overlap.
- **SFD support for SAVE, GET, RUN and MERGE commands.** The monitor command "RUN dev:file[path]" now works for arbitrary path specifications including all levels of SFDs. In addition, a subsequent "RUN" command will not require the parameters to be retyped. This description is also true for the SAVE, GET and MERGE commands.
- **Faster processing of RUN-like commands.** Large programs are loaded into memory much faster using the RUN and GET commands rather than under 6.03A.
- **User Defined Ersatz Device.** The monitor now allows users to define logical names which represent arbitrary strings of devices, PPNs and SFDs. For example, if FOO: were defined to be

```
DSKC:[1,4],OLD:,DSKB:[123,4567,ABC,DEF],HLP:
```

and the user asked the monitor to type

```
FOO:PATH.HLP,
```

the file HLP:PATH.HLP would be typed. Users who wish to use the PATH command/program (not to be confused with the PATH MIC file) to define these "device" names should read the PATH help file. Unfortunately, many system utility programs use the WILD routine which does not yet know how to use the facility properly. Programs such as DIRECT may fail if asked to reference device FOO:.

- **FILES argument for SET WATCH command.** The monitor command "SET WATCH FILES" will cause the result of any user program disk file LOOKUP, ENTER, RENAME or FILOP. monitor call to be typed on the user's terminal. The information includes the type of monitor call, the software channel used, the file and path accessed and the error code, if any.
- **Increased TMPCOR file size.** The space for TMPCOR files has been increased from 12 to 512 words. This improves the throughput for certain procedures which use the CCL procedure to invoke programs and pass information to them.
- **Additional Software Channels.** The FILOP. monitor call has been expanded so that programs using it to control I/O may use up to 80 software channels.
- **New Monitor Calls.** A new FILOP. function rewrites a file's Recovery Information Block if, and only if, it has

continued...

DECSYSTEM-10 NEWS continued

changed. This will allow sensitive files to be protected from lost data in the event of a system crash. A new DISK. monitor call returns the length of a specified file. There are several new TRMOP. functions available.

- **Support for GALAXY version 4.** The new QUEUE. monitor call provides users with a programming level interface for queueing functions. Thus, a program can create a file and immediately queue it for printing or batch processing. GALAXY version 4 will include ORION (a new operator interface), PULSAR (the tape label processor), MDA (the Mountable Device Allocator), IBMSPL (a new IBM link spooler to replace D60SPL) and the HASP multileaving work station upgrade.

- **KA10 Long Floating Point Instructions Removed.** The KL10 microcode no longer supports the old KA10 long floating point instructions. Most programs will not be affected by this change. However, old EXE files which use these instructions should be rewritten and/or recompiled to cause them to be replaced with the KL10's true, double precision floating point operations. Normally an attempt to execute such an instruction will cause the job to stop and an error message will be typed. However, if the user is unable to recreate programs which use these instructions (such as the one or two system programs which have not yet been updated), the monitor command "SET FLOATING POINT [NO] SIMULATION" may be used to cause these operations to be automatically simulated (or not) in software.

In general our early experience with 7.01 has been favourable. Comments from our users indicate that they are pleased with the product. We expect that 7.01 will serve UTCS' DECsystem-10 user commmunity very well.

Dr. Edmund West

UTCS SHORT COURSES

As of May 1, there will be a charge of **$10.00** for registration in any UTCS short course. This charge will help defray the cost of course preparation and is payable upon registration. Users will be informed by letter of the course schedule when arrangements have been made. The registration form accompanying the letter should be returned with payment to the Information Office at least two days prior to the beginning of the course. Departmental users can optionally arrange payment through the department's non-computer appropriation account.

The $10.00 is refundable only if the course is cancelled by UTCS or if, in the case of a hands-on course, there are system problems.

An average of fifteen users justifies the presentation of a course. To express an interest in any UTCS short course, please phone the Information Office at 978-4990.

Dawne Smith

ERRATUM: OF TURTLES, MICE AND APPLES

There was confusion in the March 1981 issue of *COMPUTERNEWS* about what constitutes turtle-graphics on the UCSD Pascal system on the Apple II microcomputer *(Pascal Implementations at UTCS,* page 5). The 'turtle', as explained in the text, was in fact a description of a computer input device known as a 'mouse', developed at MIT.

Turtle-graphics utilizes a cursor-like tool known as a 'turtle.' The 'turtle' can be thought of as a pointer which, when moved, draws a line in it's wake. The line may or may not be visible and can be any of six colours. The direction of the pointer can be changed by simple commands. Movement of the 'turtle' is invoked by another simple command which tells it to move a certain distance in the direction in which it is currently pointing. Thus, the turtle-graphics package can be thought of as a 'relative Polar co-ordinate' system.

The idea of the 'turtle' was devised by S. Papert et. al. at MIT to make graphics easier for children who might have trouble understanding Cartesian co-ordinate systems.

Phil Selby

USER EXCHANGE COLUMN

To all users

The Physics department has 3 computer-card filing cabinets to sell. Each metal filing cabinet has a total of 22 drawers specifically designed for holding computer cards. Anyone interested is invited to contact me at 978-2950.

Francis Beaton

APL Users' Group

An APL Users' Group has been formed on campus to discuss common problems with UTCS APL Service and to recommend improvements. The next meeting will held at 4 p.m. on Wednesday, April 29, 1981 in Room 4171, Medical Science Building. All interested users are urged to attend.

For more information call Len Fertuck, 978-5552.

Len Fertuck

A NEW EDITOR

Paul Shindman, Editor of Publications, will be leaving this month to travel and then return to school. Editor since June 1980, Paul has worked at UTCS for 3 1/2 years in different capacities. We wish him the best of luck in the future.

Thanos Kaponeridis has replaced Paul as Editor. He was working with the Communications and Small Systems (CSS) Group at UTCS as a Human Factors Specialist. We welcome Thanos to Publications and look forward to working with him.

Kathryn Bourne

PERSONNEL CHANGES

Joanne Barteski, working in the Management Office, and Ted Jakubow, working for CSS, have joined UTCS' staff. Greg Girard has returned to his previous position at CSS.

Vicki Little, Supervisor of Budget and Personnel, left UTCS in early April. Adrianna Marrelli assumes Theresa Veira's position in the Management Office. Theresa is now working for the Faculty of Medicine. The best of luck to all!

Kathryn Bourne

NEW TITLES IN THE DCS LIBRARY

Kuck, David J. et al, eds.
High speed computer and algorithm organization.
New York, Academic Press, 1977.

Shneiderman, Ben.
Software psychology: human factors in computer and information systems.
Cambridge, Mass., Winthrop, 1980.

Tanenbaum, Andrew S.
Computer networks.
Englewood Cliffs, N.J., Prentice-Hall, 1981.

university
of toronto
computing services

UTCS Newsletter Subscription/Information Request Form

If you wish to have your name and/or address added, changed or deleted from our Newsletter mailing list, please complete this form.

Please ____ add

____ change

____ delete my name and address.

NAME and ADDRESS, in full	PREVIOUS NAME and ADDRESS, in full
______________________	______________________
______________________	______________________
______________________	______________________

______ Check here if you can receive *COMPUTERNEWS* by campus mail.

I would like more information on ______________________

Please have a Computing Services Representative (CSR) contact me. My phone number is

____

Comments on this issue of *COMPUTERNEWS*

-- **FOLD HERE** --

Return to:

COMPUTERNEWS
University of Toronto Computing Services,
Information Office,
Room 206,
11 King's College Road
Toronto, Ontario
M5S 1A1

UTCS SYSTEMS

3033/N8A PROCESSOR

- located in McLennan Physical Laboratories
- provides General Purpose Job Stream, High Speed Job Stream, TSO, WYLBUR
- 8 megabytes of memory
- MVS with JES2

3033/N8B PROCESSOR

- located in McLennan Physical Laboratories
- provides administrative IMS/VS DB/DC Batch, TSO, MVS/APL and ATMS services
- 8 megabytes of memory
- MVS with JES2

DECSYSTEM-10 Model 1090

- located in McLennan Physical Laboratories
- provides General Purpose Time-Sharing
- 256 K - 36 bit words of memory
- TOPS-10 operating system

COMMUNICATIONS & SMALL SYSTEMS (CSS)

- located in SF308
- DEC GT44 System with PDP-11/40 CPU
- 2 Z80 based microcomputers
- Radio Shack TRS-80
- Western Digital Pascal MicroEngine
- Apple II Plus
- DEC GT40 System with PDP-11/05 CPU
- provides specialized graphics and interactive graphics
- provides online and real-time computing services, data acquisition and minicomputer services

UTCS DIRECTORY

POSITION	ROOM	CENTREX PHONE NUMBER
Director		
Dr. Doron Cohen	MP350	8948
Associate Directors		
Rein Mikkor	MP350	5058
Al Heyworth	MP350	4936
Faculty Liaison Officer & Manager, Text Services		
Dr. Frank Spitzer	MP345	4619
Manager, Communications & Small Systems		
Eugene Siciunas	MP350	4967
Manager, Operations		
Bill Lauriston (Acting Manager)	MP350	7092
Manager, Systems		
Ward Beattie	MP350	3579
Manager, Academic Computing Services		
Ralph Lombardi	MP350	7130
Manager, Administrative Computing Services		
Bill Lauriston (Acting Manager)	SG201	6877
Manager, Services Support		
Don Gibson	MP350	5568
Administrative Officer		
Suzan Fawcett	MP350	4428
Information & Accounting Office		
General Inquiries	EA206	4990
Accounts		
Aggie Stevens (U of T)	EA206	8702
Sylvia May (External)	EA206	7148
Supervisor, Accounting & Information Services		
Marg Doherty	EA206	3960
Access Codes		
Michelle Mulé	EA206	8703
Supervisor, Communication Systems		
Walter Rosocha	SF302	7087
Programming Services		
Bill Lauriston	SG201	6877

continued...

UTCS DIRECTORY continued

Entry Services		
Supervisor		
Vera Cabanus	MP331	5040
Text Entry		
Dale Wright	MP331	4565
Data Entry		
Zelda Anderson	MP331	5273
Keypunching		
Dale Wright	MP331	4565
Tape Librarians		
Academic Services	MP368	7319
Administrative Services	MP368A	6693
Supervisor, Applications		
Herb Kugel	SG304	7286
Computing Services Representatives		
Engineering Annex Terminal		
Sue Chong	EA104	4357
Program Advisors	EA103	4516
Time-Sharing Support		
TS Advisors	SG204	6465
John Mavity	SG204	7109
Erindale		
Peter Wall	2043	828-5311
Scarborough		
Bob Blackburn		284-3173
Arts and Science		
Bill Fehlner	SS2133	6509
New Physics		
Bob Chambers	MP1202	8823
External		
Ihor Prociuk	SG205	6875,6885
Supervisors, Operations		
Paul Scarborough (IBM 3683N8A)	MP368	6220
Krishna Patnaik (DEC-1090 & CSS)	MP368	4086
Dave Wong (IBM 3033N8B)	MP368	6864

Key:

EA = Engineering Annex
SG = 49 St. George
HU = 215 Huron St.
MP = McLennan Physical Laboratories (New Physics)
SF = Sandford Fleming
SS = Sidney Smith

Job and System Status Queries	
SYSTEM/3033,TSO	7373
ATMS/APL	6234

Time-Sharing Services	**Dial-Up**
APL,ATMS	7200 Centrex 7201 Non Centrex
TSO,WYLBUR	6200 Centrex 6201 Non Centrex
DEC-10 Services	4224 Centrex 4244 Non Centrex
PHONE-IN ADVISING	6465

UNIVERSITY OF TORONTO
COMPUTING SERVICES
TORONTO, CANADA

CAMPUS DELIVERY

MR. R.D. TAYLOR-VAISEY
UNIVERSITY OF TORONTO ARCHIVES
120 ST GEORGE STREET
UNIVERSITY OF TORONTO